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| 10/077,509      | 02/15/2002  | Jung-Lin Pan         | I-2-178.3US         | 5390             |

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VOLPE AND KOENIG, P.C.  
DEPT. ICC  
UNITED PLAZA, SUITE 1600  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103

EXAMINER

BLOUNT, STEVEN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2661

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10077509

Applicant

Pan et al

Examiner

Blount

Group Art Unit

2661

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☒ Responsive to communication(s) filed on 3/8/04
- ☒ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-16 ~~is~~ are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-16 ~~is~~ are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 4
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

Office Action Summary

## DETAILED ACTION

### *Drawings*

1. The drawings were received on 3/8/04. These drawings are accepted.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 19 of copending Application No. 09814346, and also claim 1 of copending application No. 10077527. Although the conflicting claims are not identical, they are not patentably distinct from each other because, with respect to 09814346, there is no difference between the elements in the body of the claims, and their preambles are virtually the same, a receiver (claim 19) being an obvious variant of a "time division duplex" (claim 1); and with respect to 10077527, there is no difference between the elements in the body of the claims, and their preambles are virtually the same, a base station (claim 1 of 10077527) being an obvious type of user equipment (claim 1 of 1007509).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art (hereinafter AAPA) in view of IEEE publication "Joint Detection with Low Computational Complexity for Hybrid TD-CDMA Systems" to Benvenuto et al (document XP-000928922, 1999), and U.S. patent 5,719,899 to Thielecke et al.

With regard to claims 1 - 2, AAPA teaches that it is known in the art to combine time division duplex and code division multiple access in a multiple communications system with one or multiple codes and time slots associated with a communication sent over such a system, including one code in a time slot. See page 1 of the specification. AAPA also teaches that "A typical multiple chip rate is twice the chip rate" (page 6, line 12) in accord with the well known fact that oversampling to create greater accuracy is known in the art. AAPA does not, however, teach taking the combined, sampled signal and estimating a channel response from which a channel response matrix is created and creating a spread data vector based on in part a FFT decomposition of a circulant

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version of the response matrix, and then despreading the spread vector; nor does AAPA teach the receiver to comprise an antenna, and a demodulator.

Benvenuto et al teaches estimating a channel response  $g$  and constructing a channel response matrix  $A$  based on an FFT of  $A$  in pages 619 – 620, especially page 619 (FFT taught on page 621, FT taught on page 620, column 2). Further, it is inherent that the spread signal is later despread, or else there would be no reason to send it through the communication “system” in the first place.

Regarding the antenna and demodulator, though these devices are very well known in the art, the examiner has cited Thielecke et al which teaches, in a very similar environment/device (including the use of an estimation device – see abstract), an antenna and a demodulator. See figures 1 and 5.

It would have been obvious, to one of ordinary skill in the art at the time of the invention, to have spread the combined signal of AAPA utilizing an FFT decomposition of a circulant version of the response matrix, in light of the teachings of Benvenuto et al, utilizing the system hardware taught in Thielecke et al, in order to reduce the complexity associated with multiuser detection in a TDD/CDMA system and thus allow for greater processing efficiency.

With regard to the following claims, hereinafter referred to as CI, note the following: CI 3: the only difference between claim 1 and claim 3 is that claim 1 has the word “for” in line 2 after the word “equipment”, which renders the claim essentially the same as claim 1 for obviousness purposes; CI 4: see the rejection of claim 1 and note that it would be obvious to sample at a multiple of the chip rate before input into the

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channel estimation and data detector device; CI 5: see the rejection of claim 2 above; CI 6: Benvenuto teaches sampling the combined signal at a chip rate of the combined signal; CI 7: the permutation function is at least suggested by taking the inverse of the matrix 22; CI 8: each of the rows are defined and used in the matrix computations in Benvenuto et al; CI 9 – 11: the means corresponding means described in the specification of this application are obvious in view of AAPA/Benvenuto et al/Thielecke et al as described above; CI 12 – 16: each of these claim limitations is discussed in the rejections above.

### ***Response to Arguments***

6. Applicant's arguments filed 3/8/04 have been fully considered but they are not persuasive.

Use of a multiple chip rate is taught in AAPA as discussed in the rejection, and is also taught in equation 1 on page 619 of Benvenuto.

The examiner notes applicants remarks regarding the fact that in the current Application, Benvenuto uses "codes" in creating the A matrix. Applicant states that The current application is distinguished from Benvenuto because it does not use These codes to construct the channel response matrix. The Channel response matrix is defined in page 16, lines 4+ of the specification as being  $Hc'$ .  $Hc'$  is initially, on page 9, Lines 4+, defined as follows:

"When all the signal bursts in a time slot arise from the same user in the uplink or go to the same user in the downlink, the bursts pass through the same propagation path

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and, accordingly, the same fading channel. As a result,  $H'(k)$  is the same for all bursts ( $H'(k) = h''(j) = Hc'$ , for all  $k$  and  $j$ ) and is replaced in equation 10 with  $Hc'$  as per Equation 12."

$Hc'$  is thus, generally, said to apply to the case where pass through the same path, and is a special limited case of  $H'(k)$ .  $H'(k)$  is defined on page 9, line 1 as " $H'(k)$  is the *channel response* for the  $k$ th sequence, which is defined for  $M$  multiple chip rate sampling per equation 11." Thus,  $H'(k)$  is based on spreading through the use of a multiple chip rate code. The examiner further notes that on page 6, lines 11+, it is Stated that "The signal models of Equations 1, 2, and 3 are formulated for chip rate Sampling, such as 3.84 Mega chips per second (Mcps) in 3GPP UTRA system." Equations 1, 2, and 3 are ultimately used in the derivation of equations 10 – 11. Finally, including the spreading code  $c$  to produce matrix  $A$  as discussed on page 619 Through the "combined effect" of  $g$  and  $c$  in their convolution is apparently used to give  $A$  a better estimate of the channel conditions, and is not appreciably different from the case in which the code is not included anyhow; and even if, for the purposes of argument, applicants were correct in Stating that their invention uses a channel response matrix "which does not have any of the user signature sequences or codes", this is not a "totally different approach" (from Benvenuto), as they state on page 4, line 1, for the reasons given immediately above.

### **Conclusion**

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Examiner Steven Blount may be reached at 703-305-0319 Monday through Friday between the hours of 9:00 and 5:30.

  
Ajit Patel  
Primary Examiner

SB



4/1/04